Periscope.

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ANATOMY AND PHYSIOLOGY.

Death by Electricity.

Professor Julian Kratter, of Graz, experimenting on animals, with a view of studying the action of high tension currents, divided the results obtained into three classes. In the first class a secondary alternating current of 100 volts was used; in the second a primary alternating current of 1500 volts, and in the third a strong secondary current of 1926 volts. In general the danger of the electric current increases with its tension, but not in the same proportion, and the duration of contact determines the consequences, the action being very serious, if prolonged. On the other hand, death may follow, if the current is applied several times, even if the contact is not prolonged. Animals show a different degree of resistance to the electric current, guinea pigs and rabbits being very resistant. The symptoms observed are general tetanus, with cessation of respiration, while the heart actions continue. However, the heart may stop beating and death follow; but respiration always stops first. The primary action of intense currents is stimulation of all the centres in the medulla oblongata, and the sudden hyper-stimulation causes either temporary or permanent paralysis which may be fatal. In man the action of intense currents is evinced, in the first place, by loss of consciousness, in the second. by momentary nervous troubles or disorders of longer duration, such as the railway spine. At the points of contact, burns are found. In fatal cases, lesions are found, resembling those of suffocation, and small hemorrhages may be present in the meninges and the fourth ventricle. The author found in one case hemorrhages in the sheath of the pneumogastric nerve and symmetrical hemorrhagic spots along the cervical and dorsal vertebræ. These hemorrhages indicate, evidently, the course of the current, their distribution being due to the different resistance of the various tissues to the electric currents. The *resume* of Kratter's observations is that death by electricity is primarily due to paralysis of the respiratory centres, which is a particular form of asphyxia. (Wiener klin. Wochenschr., No. 18, 1896.) Macalester.

Studies in Sensation and Judgment. (Physiological Review, May, 1897).

Touch and Pain. Edgar A. Singer, Jr. (assistant Harvard Psychological Laboratory), experimented on the back of the hand and volar surface of the arm with a needle and a bristle for the purpose of determining whether points which are sensitive to touch are also sensitive to pain. His experiments make the answer doubtful, but he thinks they point toward a discreteness of the end apparatus of touch and pain. He found that the thresholds of both touch and pain were altered by softening the skin with warm water, soap and glycerin, the treshold for touch being raised, though not at all points, while the threshold for pain was lowered, *i. e.*, sensitiveness to touch was lessened while sensitiveness to pain was increased.

TEMPERATURE SENSE. His experiments confirmed Goldscheider's. Temperature spots were found to radiate from centres at which they are relatively numerous. The centres of the cold spots usually lie close to or coincide with the centres of the warm spots. The cold spots are on the whole more numerous; they reach more quickly and are more easily located. Both cold and warm spots seem to vary *inter se* in the strength of their reactions. Their sensitiveness differs at different times. By a slight pressure on the temperature spots (already located) warm and cold were experienced at the warm and cold spots respectively. Electrical stimulation had the same effect. In every temperature spot an analgesic point was found which would bear a heavy weight on a stimulating needle without producng pain.

INTENSITY OF SENSATIONS. This was found to vary considerably owing to the "subjective" factor.

JUDGMENT. It was shown that the greater the number of possibilities of judgment, the less the accuracy of the judgment. Every perception involved a combination with the stimulus of a concept prepared by past experience. Usually the number of concepts likely to be aroused by any stimulus is only limited by the context of events which the stimulus has entered; in the experiment we still lower this number, and in proportion as we lower it do we lower the threshold value of the stimulus.

He concludes, "Not only may a difference be noticeable or not, according to the way in which we define "noticeable," but, for any given criterion of noticeability, a difference may be noticeable or not, according to what we may mean by "difference." Mere difference may be noticeable at a point at which the specific kind of difference may be unnoticed. And, finally, with the same criterion of noticeability, a specific kind of difference may be noticeable or not, according to purely mental preparedness of the subject to receive it. With these facts recognized, the problem of psycho-physics awaits a re-statement."

CHRISTISON.

STUDIES IN THE PHYSIOLOGY AND PSYCHOLOGY OF THE TELEGRAPHIC LANGUAGE. By Prof. Wm. Lowe and Mr. Noble Harter, Indiana University, (Psychological Review, Jan., 1897).

Sixty operators were tested after Mr. Harter had spent eleven months in a preliminary investigation. The following are the principal facts developed: Highest sending record as far as known is 49 words per minute or $8\frac{1}{10}$ impacts per second. Subjective influences, as fear, anger, excitement, etc., have little effect on expert men other than to make them more fluent in the use of the telegraphic language. But in those not expert the emotions of fear, of anger and even of joy have the effect of paralyzing invention, so that only spasmodic or meaningless sound groups can be made, and every one recognizes that the man is rattled. Operators think in telegraphic terms. Those who work at night depend on their office call to waken them.

While an operator may detect an error or notice that a word was not appropriate in the connection used, and be able to suggest to the sender what the word should be, the language of the message as a